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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/614,863	07/09/2003	Yasuo Inoue	29284/594	8165

7590 10/21/2004

KENYON & KENYON
Suite 700
1500 K Street, N.W.
Washington, DC 20005

EXAMINER	
CHEN, ALAN S	

ART UNIT	PAPER NUMBER
2182	

DATE MAILED: 10/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/614,863	INOUE, YASUO	
	Examiner	Art Unit	
	Alan S Chen	2182	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-15 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-15 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

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PRIMARY EXAMINER
GROUP 2100

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 09 July 2003 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 07092003.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1-14 rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-14 of application #s: 10/614859, 10/614860, 10/614861, 10/614862, 10/614864. Although the conflicting claims are not identical, they are not patentably distinct from each other because applicant recites limitations that are based on the general premise of the instant application that each functional unit requires a minimum number of paths required to connect to associated functional units, e.g., the number of paths is equivalent to the number of associated functional units needed to be connected to.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-15 rejected under 35 U.S.C. 103(a) as being unpatentable over No. 5,247,638 to O'Brien et al. (hereafter O'Brien) in view of No. 5,175,842 to Totani.

4. As per claim 1, O'Brien discloses a storage system comprising: a channel unit (Fig. 1, element 110-0 and Fig. 2, element 201-0) that transfers data sent from an upper-level system (Fig. 1, element 11) and transfers data to said upper-level system (see abstract), a cache unit (Fig. 1, element 113) which is connected to said channel unit (Fig. 2, element 113 is connected to element 110) and in which data sent from said channel unit is stored (Column 7, lines 46-65); a control unit (Fig. 1, element 111 and 112) that is connected to said cache unit (Fig. 1, element 113), and transfers or receives data to or from said cache unit (Fig. 2); a disk device in which data sent from said plurality of control units is stored (Fig. 1, element 102-1), and a plurality of paths (Fig. 1, paths between element 111, 112 and element 113), one of said paths (one path between each control unit 111, 112 and cache, 113) connecting said control unit to said cache unit.

O'Brien does not disclose expressly a plurality of cache units where the control unit and connects to each of the plurality of cache units using a plurality of paths.

Totani discloses a storage system Fig. 1, where data is transferred from an upper level system (Fig. 1, element 1) through an intermediate system that is the control unit (and channel unit, being part of the control unit, since by definition a channel unit channels the data input from a source and outputs the data to a destination), to a disk device (Fig. 1, element 3, external memory unit by all indications a disk unit, Totani discloses as storing large volumes of data, Column 3, lines 5-9 and access time

considerably longer than cache; Column 1, lines 52-60), where the control unit is connected to a plurality of cache units (Fig. 1, elements 8 and 9).

O'Brien and Totani are analogous art because they are from similar problem solving area in data storage systems where data is transferred from an upper level system through an intermediate system and stored on a disk device.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to implement multiple caches that are attached by a plurality of paths to the control unit.

The suggestion/motivation for doing so would have been to separate less frequently accessed data from frequently accessed data, the former and latter stored in a separate type cache, such that when the system is powered down, the less frequently accessed cache will retain its memory contents and load after system is powered on again and the frequently accessed cache is used only when the system is powered on (abstract, Totani). This is particularly advantageous for instance when an access request from the host is requested immediately after power up, it can be serviced by the nonvolatile cache.

Therefore, it would have been obvious to combine O'Brien with Totani for the benefit of being able to power on an off the system without losing the contents of the cache.

5. As per claims 2-10 and 15, O'Brien combined with Totani discloses claim 1, wherein Totani further discloses the connection path between the control unit and each cache are separate and independent since each cache is physically separate from each other and the control unit, requiring a separate physical path to connect each cache to the

control unit (Fig. 1, element 2, 5 and 6). As also shown in Fig. 1 of Totani, the number of paths equals the number of cache units (e.g., two paths for two cache units).

6. As per claim 11, O'Brien combined with Totani discloses claim 1, wherein O'Brien further discloses said disk device includes a plurality of disk drives (Fig. 1, element 122-125), and said control unit is connected to said plurality of disk drives (Fig. 1, element 121).

7. As per claims 12-14, O'Brien combined with Totani discloses claim 1, Totani further discloses said plurality of paths are signal lines linking said cache unit and said plurality of control units that enable the upper-level system to communicate with the disk device which entails reading and writing data to and from the cache (Fig. 1 of Totani, bi-directional nature of the buses between the control unit and the cache).

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents are cited to further show the state of the art with respect to data storage device that interface a host via cache, controllers:

U.S. Pat. No. 5,131,087 to Warr

U.S. Pat. No. 5,253,351 to Yamamoto et al.

U.S. Pat. No. 5,263,145 to Brady et al.

U.S. Pat. No. 4,633,387 to Hartung et al.

U.S. Pat. No. 4,603,380 to Easton et al

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alan S Chen whose telephone number is 571-272-4143. The examiner can normally be reached on M-F 8:30am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey A Gaffin can be reached on (571) 272-4146. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ASC
10/18/2004

FRITZ FLEMING
PRIMARY EXAMINER
GROUP 2100